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Dr. Van Cleef is Professor of Geography at Ohio State University and a frequent contributor to scientific and educational literature. His textbooks are well known to geography teachers in both secondary schools and colleges. Dr. Van Cleef spent several years as geographical advisor to a large business organization. Hence, the views presented in this article are the product of intensive study and practical experience. This is the fourth in our series on what secondary school geography should contribute to education of our youth.

Taiwan (Formosa): Japan's Southern Base. By Alden Cutshall .. 247

Dr. Cutshall is in the Department of Geography and Geology, University of Illinois, and is now on leave of absence in the Office of Strategic Services. In the last issue of the JOURNAL he contributed an article to our educational series on secondary school geography. This article is one in a long series dealing with various regions of the world that have become important to us as a consequence of the war.

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Dr. Bressman is director of the Inter-American Institute of Agricultural Sciences, Costa Rica. He was formerly director of the agricultural division of the Office of the Coordinator of Inter-American Affairs and assistant director of the Office of Foreign Agricultural Relations, U. S. Department of Agriculture. His article on rubber is authoritative and should supply a body of valuable information for the use of the teacher and student.

Better Captions for Picture Study. By M. Melvina Svec 266

Miss Svec is an instructor in the Department of Geography, State Teachers College, Buffalo, New York, and has been a frequent contributor to the JOURNAL. The article upon the use of pictures is the product of many years of experimentation with children. She has made a similar study of the use of USGS maps at the high school level. The results of her study will be published in a future issue of the JOURNAL.

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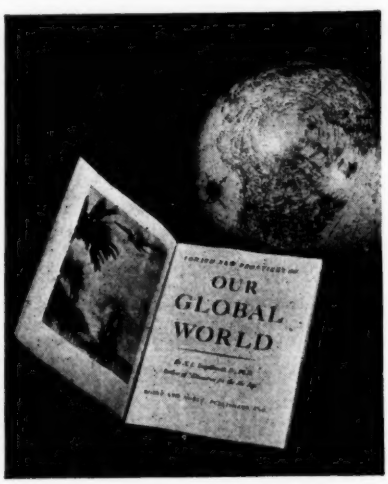

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VOCATIONAL ASPECTS OF GEOGRAPHY

EUGENE VAN CLEEF
Ohio State University

In recent years the public urge for vocational education has been pressed with ever increased vigor. Education for the mere joy of learning is receiving short shrift even at the hands of so-called educators. We hear on every hand that a cultural education is all well enough but man must make a living first and attend to luxuries later. Whether this philosophy of education be right or wrong is not an issue in this discussion. We merely wish to give recognition to the changing emphasis in the objectives of educational programs and to note to what extent geography may fit into the new point of view.

What do geographers have to offer to the advocates of practical or applied education? Will the learning of geography by the public school students aid them in earning a living? Will it enable them the better to carve out a worthy career in the materialistic realms of life? My own answer is an emphatic "yes," just as I see also distinct contributions to a student's cultural development in consequence of his study of geography. To be sure the science does not teach him how to operate a lathe, or to keep a set of accounts or to acquire expertness in the culinary art. Nevertheless it can give him an awareness of his environment, local, national and international; an appreciation of man's struggle for existence and a more effective ability than otherwise, to interpret the realities of life. Yes, it can provide direct applications to everyday life as we shall shortly note. So, as the political orator might say, "Let's look at the record."

MAP USES

No course in our school system other than geography offers the student so many opportunities to learn to read a map. While orientation via a map is of inestimable value, it is not sufficient.

To be able to *apply* the map to many different uses becomes a special asset for one engaged in business. Note a few of such uses selected from a long list.

Wholesalers and manufacturers make market surveys. These involve the collection of a considerable amount of statistical data. In the abstract they are difficult to interpret, but when transferred to the map, they take on new meaning. They present to the interested persons a picture of sales conditions or potentialities which could not be otherwise so clearly nor effectively conceived.

The realtor is interested not only in plotting property for sale, but also land use and land values. Not long ago a university student in a course in urban geography wrote a term paper involving the mapping of land uses in a given locality over a period of four decades to determine whether or not there had been changes and if so, their nature. A realtor learned about this young man's study and purchased it from him at a substantial price.

Transportation experts, advertisers, bankers and a host of other businessmen either use maps or could use maps as aids to the advancement of their economic activities. In fact there are few situations which do not lend themselves to plotting on maps. However, there are different kinds of map bases both in terms of projection and form. Some types are much more adaptable for certain uses than others. Our courses in geography properly presented, provide for student enlightenment concerning these map varieties and their most effective services.

Gardening

Students who have had courses in geography can apply their knowledge to gardening, especially in these times of food scarcities. What they learn about soil types may be carried over into an appreciation of the soil quality in their garden and what needs to be done to improve the soil. What they learn about weather and climate, particularly weather forecasting, can be put to good advantage in determining whether they should plant today or not, in view of prospective rain for the morrow or a turn to colder or to unusually high temperatures, whether or not they should attempt to grow certain kinds of fruits or vegetables in their localities—items which are better adapted to places having a more favorable combination of soil and climate. Again their geography course can

make them conscious of the significance of the topography of the land in its special relation to erosion, flooding or excessive drainage.

The Insurance Business

Young men and women who enter the insurance business, whether it be marine insurance, fire insurance, wind-storm insurance or still other kinds can utilize the training gained in their youth in the field of climate and weather. They should be able to capitalize upon that knowledge in assembling their sales talks and in making sales plans. They should be able to orient their business with respect to the geographic environment of their clientele. They should know where and how to gather weather and climatic data; how to interpret them and ultimately to correlate them with the type of insurance they have to sell.

City Planning

City planning is becoming a reality. There are some 1,400 or more planning commissions of various kinds thruout the nation. Undoubtedly many more will be created as the years pass. Geographic training can provide planners with an appreciation of variations of urban land uses; good sites versus poor sites; the significance of topography in land use, local, county or state, and in the creation of city or suburban patterns. The question of desirable areal growth of a city, the limitations of population growth in relation to water supply, and the meaning of ground water level or water tables to the well being of a community are but a few of the aspects of urban life which can be properly interpreted by those who have had a geographic background. And then there is the problem of conservation within cities. So often we conceive of conservation as applicable only to rural areas, involving proper use of forests, avoidance of excessive soil erosion, maintenance of ground water supply and other elements. But the geographer appreciates the existence of conservation problems within urban areas too. The city man is concerned with the conservation of ornamental trees, of park space, and of human energy as affected by travel time. This last phase involves the question of areal distribution of residences in relation to places of employment of the citizenry and of supply stores in relation to the distribution of population.

MANUFACTURING

While location is of importance in association with most phenomena, it is particularly so when related to the problem of locating a manufacturing plant. What is the best location for a certain industry with respect to its supply of raw materials; where is the best market for its finished products; where is the potential labor located; and where are the fuel and other sources of power? Ethnic characteristics of population need to be understood. Certain people are better adapted than others to doing a specific type of work. Finns, Italians, Swedes, Germans, Negroes and many others, each have capacities for given kinds of work which excel those of other nationalities or ethnic groups. Some are better adapted to heavy work, some to fine handicraft, some to excessive heat. The student of geography learns these relationships when he studies numerous industries in the class room. He learns the principles involved and when later in life he has need to solve some of the problems indicated he is in a position to analyze them in the light of his earlier training.

RETAIL MERCHANDISING

Persons interested in the establishment of retail shops need to note such factors as population density, cultural level and general tone of neighborhoods. Those with geographic training have learned that such elements exist and will be on the alert for them. They can map them and interpret the resulting maps. They know how to distinguish between location and accessibility. They have learned that the degree of accessibility which a store possesses is of far more consequence than its location.

Employers are learning that employees with a geographic knowledge of the commodities handled, are better equipped than those who possess no such knowledge. So it is that they have schools on their premises for acquainting their personnel with the kind of regions from which come either raw materials entering a product or the product itself. They display motion pictures of natives gathering raw materials, or processing them; views of the route followed by cargoes of goods from source to sales counter; scenes from the region, either domestic or foreign, in which the products originate. This same educational process is at times carried to the customers as a matter of developing good will. In all of this procedure the young man or woman who had a taste of geography

sometime in his educational career may either be the person who has introduced this idea or if on the receiving end, will find himself in a preferred position to appreciate the significance and application of such data.

Geography Applied to Advertising

In the field of advertising, geography may make an important contribution. The use of landscapes in copy or in window displays must be consistent with the product advertised. An advertising appeal to the people of a given region is likely to be handled more effectively if directed or formulated by one who received some geographic training as a part of his general preparation than by the advertiser without such background. Geographic knowledge is, of course, as significant in foreign as in domestic advertising. An appreciation of differing habits, customs and modes of living in general have high value for the advertiser. There would be little response to an advertisement of a breakfast food calling for the use of cream and sugar if in the region sugar was costly, cream scarce or only coffee with a bread roll were the customary breakfast habit.

The Construction Industries

In the construction industries the geographical element can be applied too. A style of architecture of buildings in harmony with the landscape, suggestions for architectural forms derived in the first instance from Nature herself, construction in terms of heat or cold resistance, with reference to precipitation in its various forms, in relation to availability of sunshine and angle of sun's rays in different seasons, the type of soil or bed-rock for foundations, paint which will withstand particular atmospheric conditions, these and many other considerations of the natural elements are known to the geographer.

The Field of Communications

We have made no mention as yet of the value of geographic knowledge in the whole field of communications, including rail, motor and water transport, telegraph, both wire and wireless, telephone service, aviation and very primitive forms of conveyances still in use among vast numbers of people the world over. Water transport includes not only ocean routes but inland waterways—lake, river and canal. Competition among these media, more particularly rail, motor and water and the development of all of them is understood

the better when one understands the full significance of the element of distances, the Great Circle routes, seasonal closing by ice of certain ways or increased hazards with the coming of certain seasons. The effect which the introduction of each of these means of communication has upon the earth's size in terms of time and distance and also in its whole economy is appreciated by the geographer. Provincialism, limited vision and even tolerance are all reasonably well interpreted by those who have had the benefit of geographic training.

APPLIED INTERNATIONAL RELATIONS

Anyone aspiring to devote his energies to international relations, whether trade, political, religious, journalistic or any of many other phases can hope to achieve total preparation only if he has had a geographic education along with the usual techniques applicable to the particular field in which he specializes. This statement may sound dogmatic, for it is unqualified. But it certainly must be obvious to the geographer who knows the content of his own field, who knows the scope and meaning of economic, political and regional geography, that *without* this basic information, this starting point as it were, an understanding, if no more than in an elemental way of the struggle for existence of the peoples who occupy the regions of the earth, and most considerations of international relationships, must lack a solid foundation. That person who is trained in geography is in a good position to qualify for any further training necessary in preparation for a position involving international affairs. The foreign trader, the diplomat, the Y.M.C.A. worker, the Red Cross official and numerous others, without exception require a geographic background to do their best work.

GEOGRAPHY: PRACTICAL AND CULTURAL

In this brief review of the many applications of geographic study to vocational preparation we can see that this training may provide not only the means for a young man or woman to earn a living but in so doing, in contrast with many other types of vocational education, provides at the same time, a broad cultural background. Courses in the field of geography, then, may yield to the student a twofold desirable attainment—a practical and a general education.

TAIWAN (FORMOSA): JAPAN'S SOUTHERN BASE

ALDEN CUTSHALL
University of Illinois

Taiwan (Formosa) is that southern island of the 1940 Japanese Empire that hangs suspended southwest of Japan proper. Its position within 100 miles of the Fukien coast of China and about the same distance from the northernmost island of the Philippine Archipelago made it of extreme military importance to the Nipponese southward advance. The European name Formosa was first applied to the island by the Portuguese sailors in 1590 when they called it *Ihla formosa* (beautiful island). However, Chinese and Japanese alike refer to it as Taiwan (terraced bay) and in eastern Asia it has been known by that name for more than three centuries. The island is not large, 13,807 square miles or about one-fourth the size of Illinois, but it supports six million people. Previous to the Sino-Japanese War and occupation by Japan in 1895, Taiwan was a Chinese island and its population has remained largely Chinese in character since that date. This, then, was the first phase in the contest of the Japanese conquest of a Chinese population.

Land Surface

Most of Taiwan possesses a rugged, mountainous terrain, with the highest peak (Mt. Niitakayama) extending to a greater height than the famous Mt. Fujiyama of Japan proper and more than 500 feet above that of Mt. Apo, the highest mountain in the Philippines. The extremely rugged interior is still unmapped and has become the home, or rather the refuge of the aboriginal tribes that inhabited the entire island at an earlier date in its history. Physiographically, however, the island has two parts: a western plains region, which makes up almost one-third of the area and is the agricultural portion of the island, and the eastern mountain section. The latter is really composed of a major range and several secondary ranges all trending in a general north-south direction. The upland section terminates abruptly on the east coast where, in some places, the cliffs form an almost perpendicular wall several hundred feet in height. This coast probably was the practice or maneuver area for those troops that scaled the sheer heights of western Luzon during the invasion of the Philippines. The rivers are short and swift, only one having a length of more than 100 miles. As a result, they are

able to supply considerable hydroelectric energy and numerous power plants are shown on the detailed Japanese topographic maps of the coastal reglons. This is an important factor in the industrial development of the island, as both Japan and Taiwan are notably deficient in mineral fuels.

CLIMATE

The island is crossed by the Tropic of Cancer and, with the exception of the mandate islands, is the only tropical possession of pre-war Japan. Actually the climate is humid subtropical, somewhat comparable to Florida and South Carolina in this hemisphere, altho less subject to frost conditions than southeastern United States. Because of its latitudinal and insular location the annual range of temperature is small, and Taiwan has warm, moist summers and mild, drier winters. Thus, it is possible to grow tropical fruits and practice multiple cropping of rice.

Precipitation is, in general, heavy, but is not uniformly distributed thruout the island. (In 1936, Karenko on the east coast had 43.5 inches while Kiirun (Keelung) in the north had 135 inches.[1]) Thruout most of the island the maximum precipitation occurs during the summer months and is associated with the southerly winds of the Asiatic summer monsoon. However, at Kiirun the cool season yields the greater percentage of the rain. This station is on the leeward side of the island during the summer monsoon, but is on the windward coast at the time of the winter monsoon, when Taiwan receives northerly winds from across the China Sea as a result of the divergence from the semi-permanent high over the interior of the continent. This heavy, yet unequal distribution of moisture means that the agricultural districts may suffer from either floods or drouths, and this is especially true on the fertile coastal plain along the western margin of the island.

BIOTIC LIFE

Most of Taiwan, particularly the mountainous eastern part is covered with a lush tropical forest which grades into semi-tropical and coniferous evergreen varieties at progressively higher altitudes. The luxuriant tropical vegetation is composed of both virgin and second growth timber and, as is true of most tropical forests, contains a great variety of woods and secondary plants. Some of the species that have been mentioned include: black ebony, camphor

[1] Gradjanzev, Andrew, *Formosa Today*, p. 6.

oak, cork oak, palm, banana, persimmon, soap tree, tallow tree, tree fern, and maple. At the higher elevations red cedar, spruce, and pine may occur. Still higher, short grass predominates.

The fauna is less rich. There are many snakes and insects, particularly mosquitoes. Malaria is quite prevalent and continues to be the scourge of the island. Taiwan differs from most warm, dense, forested regions inasmuch as there are few native birds.

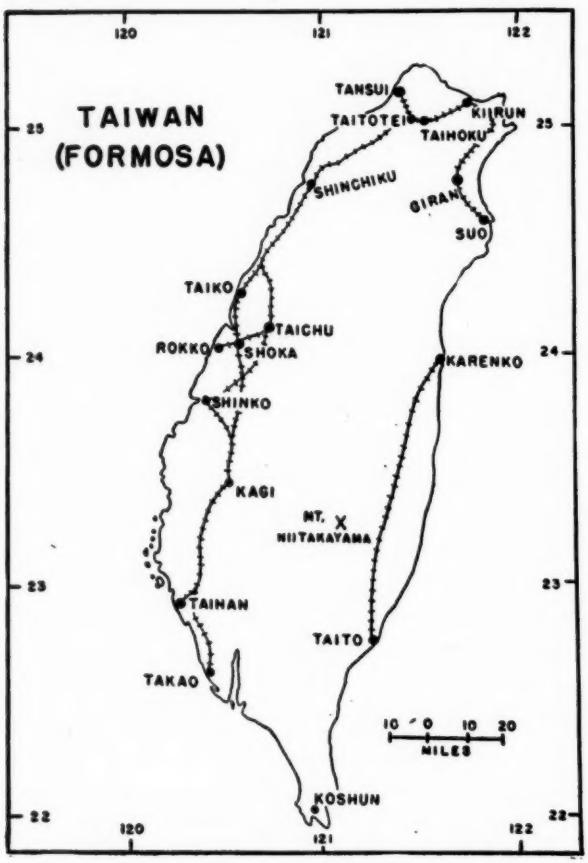
Inhabitants

The early people of Taiwan were of a Malayan or Polynesian origin, probably somewhat similar to the primitive tribes of Mindanao and Borneo. Altho the tribes were numerous, their total number probably remained quite low. They were separated from one another by high mountains and dense forests; hence remained disunited and at war among themselves. They have, in recent years, been pushed back into the rugged interior, where, partly because of their war-like spirit, their life is probably not too different from that of their ancestors several centuries ago. About two-thirds of the 150,000 aborigines are still classified as savage, and are confined to designated reservations.

Most of the population of modern Taiwan is Chinese, originally from Kwangtung and Fukien Provinces, who have remained Chinese in language, customs, and dress despite the Japanese domination to which they have been forced to submit. Actually these inhabitants consisted of two groups from two different provinces of China and rarely mingled with one another. Each group came independently and each brought with them the customs, beliefs, and superstitions which they had known on the continent. These differences between the Hakkas of North Kwangtung and the South Fukinenese often found expression in bloody conflicts. An additional source of friction existed between the earlier settlers, who were the land owners, and the newer arrivals who were compelled to rent their agricultural plots and borrow money at high rates of interest from those who arrived first. In brief, disunity and lack of organization prevailed.

Both the Dutch and the Spaniards established a base on Taiwan during the period of European economic colonization of the Far East in the 16th and 17th centuries. The Dutch arrived first, and encouraged the planting of sugar cane and the development of the camphor industry. At the same time they taxed the people and at-

tempted to convert the aborigines to Protestantism. The Spaniards came two years later and had similar objectives, except their missionaries attempted to convert the natives to Catholicism. In the end the Dutch, by military force, drove the Spaniards from the island and appeared to be master of it. However, the interests of the local population were neglected. The small size of the military garrison, together with the great distance from bases which prevented speedy reinforcements, compelled the Dutch to withdraw in the face of a strong native force.



Then, after a long period of Chinese government, Taiwan became the first Japanese colony a half century ago. But the Japanese did not emigrate to Taiwan in any sizeable numbers, for the present population is only five and one half per cent Japanese. This is a slightly higher percentage than in Korea, but is still a small minority in view of the length of time that the island has been a part of the Japanese Empire. The Japanese came as members of military forces, or because business interests required them to do so; not because of any personal desire to make their home in this foreign land of different climate and tongue.

Urban Development

The six million people of Taiwan are not uniformly distributed

over the island, for the western plains section supports by far the majority of the population. Tainan Province has more than 700 persons per square mile, approaching Java or England in density. Most of the inhabitants are agriculturalists, but the few larger cities are also located on or near the west coast with the principal railroad paralleling the coast and connecting these cities of the north and west (See Map).

Until recently, urban development has been retarded. In 1935 only two[2] cities of Taiwan had a population of more than 100,000, the figure commonly accepted as most nearly defining urban agglomerations. However, eight cities have more than 50,000 persons and urban growth has been rapid since 1930 (Table I). The capital

TABLE I

PRINCIPAL CITIES OF TAIWAN

City	Population, 1930	Population, 1935
Taihoku	186,760	278,446
Tainan	83,497	111,939
Kiirun (Keelung)	56,258	84,987
Takao	39,850	83,735
Kagi	42,293	72,980
Taichu	38,094	70,467
Shinchiku	36,377	52,107
Shoka	..	51,236

and largest city is Taihoku (1939 population, 340,114) located ten miles inland from the north coast. Kiirun, in the north, is the best port and one of the most strongly fortified cities. Takao is known as the sugar port and more recently as a strong naval base. Giran, with a peacetime population of only slightly more than 20,000 is the largest city on the east coast.

A project for another harbor to relieve congestion of commercial and naval shipping was begun in August 1939 at Gosei.[3] Other ports along the low west and north coasts are shallow, silted up from the discharge of rivers and streams and usable only by coastwise junks.

Suo, a fishing port in the north, is the only natural harbor on the regular east coast, altho some efforts have been made to develop an artificial harbor and industrial center at the city of Karenko.

[2] Four in 1940.

[3] Melville H. Walker, Japan: Basic Elements in Empires War Economy, *Foreign Commercial Weekly*, Vol. 12, 1943, p. 7.

FISHING AND FORESTRY

The inhabitants of Taiwan, as is true of most people living in eastern Asia, are a fish-eating population. The waters around the island are rich in resources of the sea and the Chinese are expert fishermen. Since fishing does not require expensive equipment, it has been a significant secondary occupation of the Taiwan coastal farmers, especially during the slack seasons. In recent years Japanese fishing and related industries have increased at the expense of the Chinese industry. This can be attributed to petty regulations and taxes upon the smaller operators and to the introduction of mechanized equipment which necessitates larger corporations with a larger capital investment.

The Japanese Empire does not contain ample forests. Hence, after the acquisition of Taiwan, the government became interested in the forest resources and acquired many forested areas for development. More than 90 per cent of Taiwan's forests are now state forests.[4] The value of forest products is not great, less than the value of either fishery or mining, the other two low value industries of the island. The more important products, however, are lumber, firewood, charcoal, and bamboo. Prior to the development of synthetic substitutes, which no doubt were stimulated by Japanese monopolistic practices, Taiwan was the world's principal source of natural camphor and camps were scattered indiscriminately thruout the more accessible portions of the eastern forested area. This industry has declined considerably but recent statistical information is lacking.

AGRICULTURE

Agriculture is the principal occupation, with rice and sugar cane the two competing crops. The island is a part of the economy of Japan and, in order to serve that country's needs, rice and sugar have been emphasized. Both, in Taiwan, are essentially cash crops. Sweet potatoes and vegetables are chiefly for home consumption. Other crops include cotton, tea, bananas, ground nuts, tobacco, jute, cassava, pineapples, oranges and ramie.

Rice culture was important before the Japanese came to the island and the surplus was exported to China. However, production has more than doubled during the present century and now more than half the normal production of 46,000,000 bushels is sent

[4] Gradjanzev, op. cit., p. 88.

to Japan. This supplies about six per cent of Japan's consumption. The greatest increase in production occurred between 1920 and 1935, partly as a result of encouragement and pressure from Japan proper, partly as a result of assistance in building dams and irrigation canals, and partly because a new, more palatable variety of grain was developed. This increase is not indicative of a higher standard of living in Taiwan, for the Chinese farmer of the island probably eats less rice than he did forty years ago. Both paddy and upland rice are cultivated but the former makes up more than 95 per cent of the total acreage and an even higher percentage of the annual yield. The climate permits two crops of paddy rice per year, most of which is grown in the northern part of the island.

Sugar cane is indigenous to Taiwan. The Dutch found it there in the 17th century and encouraged it. Later it was grown by Chinese producer's co-operatives. These co-operatives cultivated the cane, extracted the sugar in their primitive mills, and exported the surplus production. The arrival of the Japanese and attendant guerilla warfare ruined the industry and it had to be reconstructed later. The Japanese were anxious to develop the sugar industry for, altho sugar cane can be grown in Japan, only a small percentage of the domestic demand can be supplied from local cane. Taiwan, with its more tropical climate, can be used to meet this deficiency, and in recent years has supplied about 90 per cent of the sugar used in Japan. In addition, small amounts of sugar were exported to China and Manchukuo in the late thirties. Between 1905 and 1908 the area under cultivation was increased fourfold and the total production increased more than ten times. This resulted from national recommendations, together with direct governmental regulations. The latter were necessary because the farmers of Taiwan do not always prefer to plant those crops that are most necessary to national self-sufficiency. Secondly, improved varieties of cane were introduced from Hawaii, experiment stations were established, and recommendations were made concerning sugar manufacture. These were followed by grants of assistance and subsidies to both manufacturers and farmers to induce them to follow the recommended policy. The sugar producing districts are primarily in the warmer, southern portion of the island.

The more important secondary crops are bananas and pineapples. The first mentioned is indigenous to Taiwan but has become significant only in recent years. Possibly because of the perishable nature of the fruit, only a small fraction of the production is ex-

ported. Pineapples, too, have been cultivated for a long time, but expansion of the industry came only after modern canning techniques were introduced. This fruit is grown on the steeper slopes; hence does not compete with cereals and sugar cane. For that reason the future appears somewhat promising. Cotton is a more recent introduction and does not occupy a significant position in Taiwan's economy. Like sugar cane, it was introduced because it benefited Japan proper; not because it was an advantage to the people of Taiwan. Sweet potatoes may be important during the present conflict for the production, for war purposes, of absolute alcohol has been stimulated. Tea is an old crop and until supplanted by sugar was the leading export of Taiwan. It is a hillside crop, principally in the hands of the Japanese, and production is localized in the northern part of the island.

The government has devoted considerable time in an effort to promote higher yields of cultivated agriculture. But even so, the average yield per acre, in nearly every case, is only 50-75 per cent of that in Japan proper. Sugar cane yields are much lower than in the Netherlands Indies, altho this may be partially attributed to a slightly less suitable climate, and cotton yields are low for a region of intensive agriculture.

Taiwan has an animal industry, but draft animals predominate over those used for meat or milk. Either the water buffalo or some type of cattle is used for draft purposes, for horses, donkeys and mules are entirely absent from the local economy. In recent years horses have been raised to supply the Japanese army—another governmental plan. There has been a considerable increase in the number of swine and poultry and these are a significant source of meat and income. The animal industry is related to the sugar industry for the cane waste can be used as fodder. In this respect Taiwan is less handicapped than Korea and most of Japan proper. Sericulture has been encouraged for physical conditions are favorable to the industry and production costs are low. However, the industry has never been popular and production declined in the late thirties.

MINING

Mining activities are limited both in quantity and variety, and most of the mining is in the northern or northeastern part of the island. The various gold ores and coal account for more than four-fifths of the total mineral output. The former, together with the associated silver, is the first ranking mineral product and one of

Taiwan's valuable exports. Coal mines behind Kiirun provide some bunker coal and lignite. The coal measures are extensive with seams two or three feet thick. However, volatile matter is high, as much as 65 per cent in some cases. Petroleum occurs in Taiwan, but only in extremely small quantities. In fact, from the local point of view, natural gas is more important than petroleum. Copper, sulphur, and building stone are of lesser importance and salt extraction, by evaporation, is a government monopoly of some value.

Manufacturing

The manufacturing industry ranks second to agriculture in Taiwan, however, the latter is well in the lead. If compared with Japan, Taiwan is not a manufacturing region for the total gross value of manufactures is only about two per cent that of Japan's total. Taiwan's second industry is closely associated with its most important one, for more than 70 per cent of the manufacturing is the processing of agricultural products—the foods industry. (Chemicals follow, making up about one-third of the remainder.) This processing is chiefly the manufacture of sugar and the canning of pineapples. The lumber and paper, textile, metal and machine industries are increasing slowly, but are relatively insignificant industries. More than half (55.7 per cent) of the 87,000 industrial workers are engaged in the foods industry and almost 10 per cent are ceramic workers, which occupies second position with respect to number of wage-earners employed.

Heavy precipitation on a mountainous terrain provides an abundant supply of potential water power. The development of much of this hydroelectric energy has permitted the location of some light metal, chemical and other strategic industries in Taiwan. The latest information available indicates that the largest power plant is near the center of the island at Lake Jitsugetsutan. The irony of the situation is this: American engineers surveyed the possibilities and verified its feasibility, then a loan by a New York banking syndicate financed the construction of the power plant. The completion of this plant as well as Jitsugetsutan Plant Number Two led to plans for making Taiwan into a manufacturing area using raw materials from southeastern Asia. The actual development of these plans is problematical, for Taiwan certainly lacks an industrial population and probably was further handicapped by lack of industrial machinery and equipment.

In certain fields, however, progress has been made, and aluminum production is an outstanding example. The Nippon Aluminum

Company has an important plant at Takao and a second, smaller one at Karenko. In addition, special efforts have been made to develop iron and steel and the chemical industries, particularly artificial fertilizers. The railroad rolling-stock mill, between Kiirun and Taihoku, has been expanded as has the dock yards at Kiirun. No doubt the ship-repair yards at both Kiirun and Takao have been materially expanded and now are probably ship-building yards as well as repair yards.

STRATEGIC POSITION AND UTILIZATION

In seizing the island fifty years ago the Japanese probably had two objectives in mind: (1) to exploit it commercially, since Taiwan's tropical products (sugar, rice, cotton, and jute) would serve to offset certain Nipponese raw material deficiencies; and (2) to use it as a base for further creeping aggression in China and the Asiatic islands which probably was contemplated at that date.

The possibilities for commercial exploitation of Taiwan are, in part, history. Its potentialities are great and the development has been a planed economy, planned for the benefit of the Japanese Empire rather than the Chinese farmer living on the island. This procedure has, to a large extent, made Japan independent of foreign powers for most of the products of tropical agriculture, but other conquests were necessary in order that it might occupy a similar position with respect to minerals.

For these later conquests, Taiwan was to serve as a convenient base from which to launch (and protect) the southward steps. Two strong naval and seaplane bases (Kiirun and Takao) were developed and army bases and air fields were constructed. The tropical jungles of Taiwan served as practice training and manuever areas for those soldiers being trained for jungle warfare. The steep eastern cliffs, similarly, were used for practice invasions by those troops that were later to land on the cliffy shores of northern Luzon in December, 1941. Its position within less than 100 miles of the China coast, within about 500 miles of Manila, and within 600 miles of Hainan allowed the island to serve as a stepping stone in later conquests which were individual moves in the master plan of Japanese aggression. Governor-General Hasegawa once called the island "a giant stationary aircraft carrier." This statement briefly emphasizes the role which the island has played in Japan's military conquests. From Taiwan as a front line base, Japan was able to shorten tremendously the lines of its overseas attacks on South

China, French Indo-China, the Philippines, and other areas.

The final conquest of Taiwan itself is not yet a finished chapter. A complete exploration of the interior mountains so that the potentialities can be inventoried is necessary. Secondly, tropical diseases, especially malaria, are still prevalent. Finally, the inhabitants are not in accord with the Japanese economic system, even tho tolerant of the rulers under which they live and work. However, these problems are now secondary; the Japanese must first consider the more immediate problem which they have started in southeastern Asia.

RUBBER: NATURAL OR SYNTHETIC?

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Simultaneously today move two great rubber developments of far-reaching importance to the economic future of the Americas. These are the creation in the United States of a synthetic rubber industry and, in the tropical Americas, development of natural rubber production. Which of these two will win out in the long run? The answer holds large meaning for the Americas. Rubber is indissolubly bound up with the economic destinies of the hemisphere. What rubber means to our motor and machine age has been well illustrated in the repercussions from the loss of rubber supplies in the Far East.

Right now the important thing is to get rubber. We must get it from any and every source available, natural and synthetic, as quickly as possible. That is all that matters immediately. Without rubber, the United Nations war machine and the civilian economy of the Americas would be severely handicapped. Lack of rubber can prolong the war. Lack of rubber can cause infinite confusion in civilian life, as we know only too well. Still it is worthwhile to examine now the challenging question: Are we to rely for the long-range upon natural or synthetic rubber?

Perhaps the answer to this challenging question lies in the test tubes of patient chemists, in the research and experiment stations of the tropical Americas which are producing strains of disease-resistant and higher-yielding rubber trees. Science holds the answer —science in the industrial laboratory and science in agricultural

experiment stations. Which will win in the long run: the science of the industrial laboratory or the science of modern agriculture? The chemist has produced many fateful changes in our economic life in the last two decades. But probably no single development holds more potent possibilities than the race between the chemist and the agricultural scientist to supply the expanding needs of the Machine Age for rubber and to supply it cheaply and abundantly.

HEMISPHERE CAN CUT RUBBER COSTS

As director of the newly-established Inter-American Institute of Agricultural Sciences, at Turrialba, Costa Rica, I am identified with the scientific effort to grow natural rubber in the western Hemisphere, to produce it economically so that American rubber growers may hold their own in the long-range test for survival, so that they may meet competition from any quarter—whether from improved synthetic rubber or from low-cost natural production outside the Western Hemisphere. I have faith in the ability of American rubber growers to hold their own, once they get well started with improved strains of rubber trees. I believe the costs of growing natural rubber in the Western Hemisphere can be reduced beyond anything which has been demonstrated heretofore. And, in that firm belief, I am hoping that natural rubber will have full opportunity to prove its capacity to survive, whether the competition comes from the ingenious chemist or producers able to draw upon large reservoirs of low-paid labor outside the Western Hemisphere.

I shall not attempt to narrate, or to analyze, all the developments going on now in rubber. Much of the rubber program for immediate war needs is concentrated on efforts to increase quickly production of wild rubber in the Amazon basin and in Central America. The program also includes large projects for production of rubber from quick-growing plants, such as cryptostegia and guayule. I am concerned here mainly with the story of what is being done to put natural rubber production on a sound basis for the long run, with the possibilities for developing small unit plantations, with the question whether natural or synthetic rubber will become our chief source of raw material.

WORLD CONSUMPTION OF RUBBER IS GROWING

There can be little doubt, I am sure, that the lessons of this war will count heavily in our long-range policies on rubber. We have

learned by bitter experience the dangers of dependence upon distant sources of rubber when we can produce rubber at home or near to home. I am assuming that in the post-war period we shall want to rely—certainly more than before the war—upon nearby sources of rubber. That will mean natural rubber from the tropical Americas or synthetic rubber from plants now rising in the United States. Perhaps these in combination will be the answer. For one thing, it must be recognized that rubber consumption in the other Americas is growing. If this trend continues, as appears likely, the other Americas will use more and more of their own natural rubber production. It also must be recognized that potentially the tropical Americas could increase rubber production greatly and provide a large exportable surplus. How far they go in developing an exportable surplus will depend upon the ability of American-grown rubber to stand up in competition in the market-place, whether it is competition for the United States market or for markets outside the hemisphere.

Another point to be stressed is this: World rubber consumption in the past few decades has increased rapidly. The curve of consumption, both in the United States and outside the United States, seems likely to continue to rise for a long time. I believe United States consumption of rubber will expand until it doubles, at least consumption during the peak year of 1941. In that year the United States used around 775,000 tons. If I am correct in this assumption, the long-term uptrend in rubber consumption will mean the United States eventually will require 1,500,000 tons of rubber annually. That means a billion dollar industry. What a prize for the chemist and agricultural scientist! Surely this is a prize rivalling the gleam of wealth which drew gold seekers to the Americas hundreds of years ago. Here is an El Dorado worthy of the magic of modern science. It is a story of fortune hunting evolving out of the urgent needs of wartime, in the obscurity of patient research behind the drama of the fighting fronts. Yet, in the long-run, this may be one of the most important stories of our time.

Plantation System Being Developed

On the news desks, synthetic rubber has out-rated natural rubber in the headlines. This results partly from the controversy over production of synthetic rubber, whether it should be made of grain or oil, whether we should aim for capacity to make a million tons of

synthetic rubber or half that amount. While this controversy draws the headlines, millions of young rubber trees grow in the sun of the tropical Americas. These are the vanguards of the new plantation industry, the plantation industry which I believe will be able in the long run to stand the test for survival.

In this new plantation industry, inter-American cooperation plays a big role. The Inter-American Institute of Agricultural Sciences, sponsored by the Pan-American Union, with initial funds provided by the Office of Inter-American Affairs, is but one symbol of progress in inter-American cooperation which is making possible the hemisphere rubber-development program. Fifteen of the Latin American countries, together with the United States, are active participants in the inter-American effort to bring rubber back home and to place it upon a solid economic foundation. The United States Department of Agriculture, in collaboration with the tropical Americas, is carrying on research for the improvement of plant materials and for commercial stimulation of existing strains resistant to leaf blight as well as high-yielding strains. In the 100 cooperative nurseries established in the other Americas, nearly 30,000,000 budded trees already have been produced. These are material for the plantation industry. Five experiment stations strategically located are making available scientific research and guidance for development of plantations, small and large. The Institute of Agricultural Sciences is preparing to take an active hand in this program, in collaboration with experiment stations of the other Americas.

Thus we see taking shape the dreams of those who years ago saw the need for growing rubber supplies closer to home. Former President Hoover, in 1926, when he was Secretary of Commerce, initiated studies of rubber-growing in the hemisphere. President Roosevelt, Vice President Wallace (while Secretary of Agriculture) and former Under Secretary of State Welles aided in a drive to get Congressional action which finally, in 1940, resulted in appropriation of $500,000 to enable the Secretary of Agriculture to conduct investigations for development of Western Hemisphere rubber production. Dr. E. W. Brandes, in charge of the Special Rubber project of the United States Department of Agriculture, had done a remarkably speedy and thoro job in field studies for this development. Now the essential plant material, consisting of Hevea rubber trees of high yields and disease-resistant strains from the Orient,

developed in the tropical Americas, is available for further expansion of a natural rubber industry in the Americas.

Tree Disease Combated

The most important of the cooperative field stations is located at Turrialba, near San Jose, the capital of Costa Rica. This station, started in 1940, is fully equipped and stocked. It possesses ample land for nurseries, clone collections and other limited plantings. Turrialba was selected as the site because it is ideal for investigation of the most serious pest of the rubber tree in this hemisphere, the South American leaf blight. The volcanic soil is excellent for growing rubber. Moreover, it is well situated to collaborate with the Inter-American Institute of Agricultural Sciences in future research and development work.

The government of Costa Rica has provided a thousand-hectare experiment station, known as "Los Diamantes," near Guapiles, about 50 miles from Turrialba. This farm is less than 1,000 feet above sea level and is representative of the broad northern coastal plain, which is well adapted for rubber growing. It will serve primarily as a propagation garden to supply bud wood to growers in regions infected by the leaf blight.

Another important cooperative field laboratory is at Belem, Brazil, gateway to the Amazon rubber country. This laboratory is located at the Institutō Agronomico do Norte, operated by the Brazilian Department of Agriculture. Considering its strategic position, the Belem center may have a key role in the development of rubber production in the Amazon basin. Studies will be carried on there in different kinds of Hevea rubber indigenous to the Amazon country. Scientists will collect bud wood and seeds of superior trees. Up-river stations will be established to carry on agronomic research. Improvement in tapping methods and preparation of rubber from wild trees immediately are receiving special attention in view of the need of rubber for war purposes.

In Haiti, a cooperative field station has been established at Marfranc for propagation of planting material. This material will be available for distribution locally and to nearby countries. The leaf blight has not been found in Haiti. Strains of Hevea rubber susceptible to leaf blight will be crossed with resistant selections from the jungles of South America at the Marfranc station.

The cooperative field station at Tela, Honduras, is located at the

famous Lancetilla Farm, research station of the United Fruit Company. Two plantations of mature seedling rubber trees planted in 1926 by the United Fruit Company are sources of seed used for root stock production. In addition, the latest of these mature trees is used in developing techniques for small-scale or family-size rubber enterprises.

In Mexico, cooperative projects are under way with the Ministry of Agriculture at the El Palmar experiment station near the city of Tezenapa, state of Vera Cruz. Some 300 acres of mature rubber trees near this station provide ample seeds for production of root stocks and are under investigation for superior clones. Some of the latter, following blight-resistance tests at Turrialba, may prove valuable for commercial planting.

Varieties of Product Kept Separate

In former times, when there was no competition to force rubber growers to develop special products for specific uses, the latex yield from all types of clones and rubber trees went to make up a conglomerate mass. This yielded a general or all-purpose product which had to serve wherever rubber was required. This all-purpose product, of course, had many shortcomings. In the last three or four years before Java and Sumatra fell to the Japs, the Dutch were beginning to make great strides in developing natural rubber for specific purposes. They had found that latex from different rubber trees, and particularly different strains, varies greatly in its properties and that it was of value to keep the latex produced from different strains of trees separate for use where best adapted.

For years chemists have stressed the fact that some synthetic rubbers are resistant to oil and gasoline. Such resistant qualities can be utilized only in such limited ways as in the manufacture of hose for filling stations and by no means offset the shortcomings of these synthetic rubbers. To my mind, in these times only such qualities as can be utilized in making tires are worth emphasizing.

Chemists advocating synthetic rubber on the basis that it has tremendous possibilities in developing products for specific uses, apparently lose sight of the fact that Nature is far ahead of them in the ability to produce different kinds of rubber adapted to specific uses. It is due largely to the fact that producers of natural rubber, particularly in this hemisphere, are not organized, that their product does not receive the wide and favorable publicity accorded synthetic rubber.

As regards price, of course, there is no comparison between the two products—natural rubber is much the cheaper. Even if the raw material were to cost nothing, it seems illogical to expect that synthetic rubber could be polymerized out of either alcohol or petroleum in a city factory, paying high taxes and wages, overhead, etc., at a price comparable to that involved in the production of natural rubber, which is an ideal small-family industry. It is to the interest of rubber consumers in this country to see that the rubber of the future comes from a really cheap source. In the future, it should be possible with fully mature plantations of high-yielding trees to produce rubber at 10 cents a pound or less.

As indicated above, rubber production is an ideal small-family industry. The Goodyear Rubber Plantations Company, which has carried on experiments with tropical American rubber plantations since 1935, has emphasized that in the development of rubber production in this hemisphere small plantings can play an important role. Altho there are some large plantings, like those of Goodyear in Costa Rica and Ford in Brazil, in the future local farmers in those countries will be encouraged to make small plantings of a few acres and to utilize the large plantations and the cooperative experiment stations of the United States Department of Agriculture as sources of planting material.

No tropical crop is more suitable for farm production than is rubber. The mature trees are tapped and the latex is converted into dry rubber, usually smoked sheets, by a simple process which may be carried out with an investment in equipment of as little as $50.00. The equipment required consists of such materials as discarded oil drums, homemade wooden paddles, and crude smokehouses built with local materials.

In the Far East over half the rubber is produced on individually-owned farms of less than 100 acres each. To bring these farms into production the grower must wait from 5 to 8 years before the trees are tapped and bring him a cash return. These growers use part of their land for producing food crops and often interplant the rubber trees with such tropical crops as coffee, cacao, bananas, and rice.

Benefits to Rural Population

The good wages which rubber production brings the small family unit, providing them a cash income to supplement the living they get off their place, help to develop contented rural popula-

tions. Contented rural populations will undoubtedly mean much more to the future of this hemisphere than some synthetic rubber factories run under high-tariff protection.

Actual prices for synthetic rubber, taking into consideration the contemplated large-scale production and the benefits to be expected from research during the next few years, will be around 30 cents a pound for synthetic rubber from petroleum and about 40 cents for the same product from grain.

Vice President Wallace, in an article that received widespread attention ("Against a New 'Isolationism,'" in the *New York Times Magazine,* July 12, 1942) said: "Looking ahead to the new time of peace, the motorists of the United States will not only want to have an assured source of rubber, but they will want to get that rubber as cheaply as possible. In the matter of cost, natural rubber from either the Far East or the Western Hemisphere is likely to have a big advantage over synthetic. And, even if synthetic rubber is available in large quantities at a low price, a substantial amount of natural rubber will still be needed for mixing with the synthetic product."

"Few automobile users in the United States realize that the technology of producing rubber from trees is changing almost as rapidly as the technology of producing synthetic rubber. During the last 10 years, higher-yielding strains of rubber have been developed. Some of these strains yield two, three, four and even five times as much as the old-fashioned strains customarily used in the Far East. With modern strains of the Hevea rubber plants, there is every reason to believe that during the period after the war rubber can be profitably laid down in New York City from either South America or the East Indies at less than 10 cents a pound. Therefore, to protect synthetic rubber produced in the United States from destructive competition would require a tariff of at least 10 cents a pound and probably 20 cents."

As previously indicated, natural rubber, under modern conditions, should not cost more than 10 cents a pound to produce and probably will be produced for less. There is no question that the continued and increased production of natural rubber is to the interest of the consumer, and it is my hope that as time goes on it will gain as much support as is now back of the synthetic rubber industry.

Prospect for Other Plant Sources

In this discussion, so far, I have dealt exclusively with Hevea rubber in referring to the natural product. Hevea is preeminently the most important species for commercial rubber production, but there are other kinds which offer great possibilities, not only from the standpoint of low cost of production under proper conditions but specific qualities. In certain areas in Mexico and Central America conditions are more favorable to the growing of Castilla than Hevea rubber. In those areas, however, as in the West Indies, the Cryptostegia plant, a source of high-quality rubber, appears to offer possibilities.

Cryptostegia rubber under present conditions might cost as much as 75 cents per pound. Indications are, however, that with continued research and experience in growing it, it may be possible to bring its cost per pound down to that of Hevea rubber. Under ordinary growing conditions it will produce only 400 to 500 pounds of rubber per acre. Under the most favorable conditions, that is, with fertile soil and high rainfall, it is a potential source of more rubber per acre than any other rubber plant known. It is believed possible with proper horticultural practices to stimulate its fast-growing young water shoots or branches, to yield over a ton of rubber to the acre.

At present there are many unknown quantities in the production of Cryptostegia rubber. Good techniques for it cannot be worked out until large-scale plantings are in production. As yet not even the important operation of tapping has been completely worked out for Cryptostegia. In areas where labor is plentiful it may be found practicable to cut the young shoots of the Cryptostegia vine so as to have the latex drain into cups as in tapping operations with Hevea or Castilla Rubber. It appears more probable, however, that the mature vines will be cut and gathered by some mechanical means and the latex extracted chemically.

Just what the chief source of our rubber will be 10 years from now no one can say with certainty. All signs, however, point to natural rubber as the product on which we shall rely mainly in the tremendously expanded industry of the future. Natural rubber has served our needs well in the past and there is every indication that it will continue to do so in an increasingly satisfactory way as time goes on.

BETTER CAPTIONS FOR PICTURE STUDY

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Practical captions on pictures provide for the expression of worthwhile geographic relationships. The possibilities in a picture of satisfactory geographic quality[1] are so often limited by the unhappy choice of the idea stated in the caption. Paradoxically, the most significant item may be overlooked and some small detail is emphasized.

The mere phrasing of a caption is a controversial topic. Witness the evidence at hand. A casual examination of textbooks and illustrative materials for class use provides a variety of examples. Some pictures lack ready-made captions. These pictures can be used in several different situations with a different point of view suitable to the occasion. Other pictures appear with long or short captions, the content being to the point or quite unrelated to the central theme in the view. These, then, are the materials provided for supposed acceptable picture study material.

ANALYSIS OF READY-MADE CAPTIONS[2]

The shortcomings of ready-made captions are evident in the following examples which are not exact quotations but the similarity is sufficient to illustrate the points made in the above paragraph.

"Ploughing in Iran. The plough is drawn by eight animals."

"Modern Coking Ovens. Every part of the coal is made into some useful product in the modern coke oven. By the use of this plant, intelligent conservation is practiced."

"This is a wheat field in the Dakotas. This farm has hundreds of acres in this crop. How many bushels will it yield per acre?"

Exception is taken to these samplings because of (1) the use of fragmentary phrases, (2) the needless repetition of words and ideas, and (3) the introduction of irrelevant material. Consider each of these statements in order. It is not necessary to read the caption to learn that there are eight animals and that the work is the preparation of a field. A casual glance at the picture and at the caption satisfies the reader. The challenge is lacking to raise

[1] For an understanding of the geographic quality of pictures and their classification, see article by Lynn Halverson on "Pictures in the Teaching of Geography" in THE JOURNAL OF GEOGRAPHY, Dec. 1929.

[2] For obvious reasons, the pictures and captions from textbooks are not reprinted in this article. The exact words are not given.

problems about the work of the people or why they are performing their work in ways different from the reader's experience. Both the first and second examples repeat a needless phrase. In addition, the second caption introduces an idea about conservation that has little to do with the picture. If this idea is used as a means of contrast with a bee-hive oven, then comparative picture study can bring out worthwhile comments relative to conservation. The third caption uses words and terms that are vague and irrelevant. The concept of "hundreds of acres" has little meaning to those not living in the wheat regions. Finally, the question as to the yield per acre is the height of incongruity. The answer to that query can be found in a table of statistics and no amount of gazing at the picture will ever provide the solution. If such data are facts to be learned—for such facts are worthwhile and are of value at certain grade levels—then a picture is not to be used as an excuse for bringing out that detail. It is true that the low productivity per acre is related to extensive farming in marginal production areas, but the picture cannot shed any light on the exact fact asked in the question. If the pupils raise the question about yields per acre after studying other aspects of the picture, then follow the idea thru by using the proper source material and reference books.

Standards for Captions

The inadequacies of captions have been briefly suggested. The need for improvement is evident. Standards for desirable captions should, (1) provoke examination of the picture, (2) present an idea in clear and correct form, (3) employ a variety of ways of expressing ideas, and (4) use properly graded vocabulary and concepts. These standards are applicable to all classes of geographic pictures (see Halverson article for this classification). These standards are applicable to all types of pictures such as slides, movies, flat views, and those used in an opaque projector. These standards are suitable for both oral and written use. When pictures are used for individual study, write the captions on a slip of paper and clip to the pictures. When pictures are used for class discussion, follow the same standards and principles as in written expression.

By way of illustration, these criteria are now applied to two of the same suggested mental pictures cited in the third paragraph.

"From a study of the picture, discover why so many animals are needed to prepare this field."

The pupil must study the picture to discover, (1) the number of animals, (2) the kind of work going on, (3) the tools used, and (4) any evidences that help to explain why the animals, tools, and work are carried on in this manner. The evidence shows: cloddy earth, turf or sod or stubble cover, wooden plough, and a high sun for the shadows are directly under the beasts.

A suggested caption for the wheat farm picture is:

"This Dakota wheat farm is an example of extensive farming. Explain."

Evidence gathered from the view includes: (1) wide spread area to the far horizon, (2) lack of farmsteads, (3) use of machinery, and (4) the apparent sameness of land use. Any corollaries resulting from these ideas provide the class with problems to be solved by further reading and by the use of other reference materials.

Use of Pictures

If a picture is worth printing, it is worth using. Of the many ways to use pictures, a few are suggested: (1) to introduce a unit, (2) to orient a unit, (3) to raise questions, (4) to answer problems, (5) to amplify and verify information, (6) to state definitions, (7) to review a unit or portion of a unit, and (8) to set up drill and review content. Possible ways of using pictures in each of these situations will occur to the alert teacher (see Halverson article for details).

Visual Imagery in Pictures Based on Captions

A picture of high geographic quality can have several possible captions. A different emphasis is achieved by the mere wording of the caption. The teacher or author must decide the point of emphasis. Imagine a view of a nomad camp in the Iranian Plateau in which the details observed are: bare hills, rocky land, few grazing sheep, no trees, a tent, a loom with a partially completed rug, and a few nomads. Assume that the caption of the picture is, "Rug Making in Iran." The obvious omissions come to mind. Here is a picture with possibilities unlimited, and just nothing is done to capitalize on the wealth of visual information before the reader. Three different captions are herewith suggested for this picture with each one using possible geographic relationships visible. Each caption in turn emphasizes one item: the tent, the resources, and the rug making.

Example I. "Why do these nomads use a pavilian type of

tent?" *From the picture* the following ideas can be noted: (1) short poles, (2) lack of trees, (3) moving nomads would not want to carry too much lumber, (4) pavilion tent gives more shade than a tepee type, (5) a low tent is close to the ground in open country and so is out of the wind, and (6) loom is out-of-doors, so it is not very rainy here most of the time.

Example II. "How does the way these people make a living fit into this kind of region?" This caption seeks to emphasize the influence of natural resources on occupation and land use. *From the picture* the following ideas can be noted: (1) thin and scattered grassland must be good enough for sheep, (2) the hillsides and rough lands would be better for sheep than for cattle, (3) the people can move their tent homes when the pasture becomes poor, and (4) wool is used for rugs which are valuable and will not spoil before they are sold.

Example III. If the emphasis is to be on rug making, then the caption might be, "Why is rug making important to these nomads?" *From the picture* the following ideas can be noted: (1) the loom is handmade, (2) the wool is from their own sheep, (3) the loom can be moved, it is not stationary factory machinery, and (4) almost the only product the nomads can make for sale is rugs. From personal experience, or from exhibits seen at a Museum, or from pictures the pupils will realize that hand work commands a high value and the rugs are worth carrying to a caravan center to be sold.

Altho these three captions, stated in question form, direct attention to three different aspects of the same picture, there are other phases that have not been mentioned. Comments will be made and questions asked about the clothing the nomads wear, the possible aridity of the region, the lack of some of the commonly accepted items of everyday life, nomad food, natural vegetation, and other features that will occur to pupils. To take adequate and correct care of these problems, it is possible that other pictures and maps need to be used. Further reading is also advisable.

Expanding the Full Use of the Picture

It will be evident by now that the full use of a picture is not exhausted by a single caption. Other ideas are brought out by the expansion of suggestions given in discussion and in pupil cues. Equally important in the discussion of picture content is the avoidance of wandering too far afield from the actual facts. The realm of fanciful imaginings and haphazard guessing of possibilities

is to be discouraged with firmness. Pupils are aware of the limits permitted in wandering off the topic and from class standards. These self-critical appraisals are the outgrowth of constant effort on the part of the teacher to return the critical evaluation of class contributions to the class. Teachers are prone to either let casual inaccuracies pass by unnoticed or to pass judgment most of the time. Surely the weighing of evidence and the practice of suspending judgment until a reasonable amount of evidence has been considered provide for the exercise in the practice of critical thinking, one of the desirable goals of education for citizenship.

Pictures Lacking Thought Provoking Imagery

As the saying goes, "You can't pump water out of a dry well," so also it is impossible to ask thought provoking captions about pictures lacking content. Again, reference to the Halverson article will clarify this idea that pictures of low geographic quality have little to offer. Consider the pictures of some familiar buildings, the interior of an industrial plant, an invention, and a posed picture. There is little actual geographic quality about any of these items. Therefore, it is not only impractical but irrelevant to use captions such as the following:

"Discuss the architectural features of this building."
"Name the raw materials used in the manufacture of tires."
"Who invented this machine?"

Altho these sample captions may appear absurd, similar examples actually appear in books and on ready-made visual materials. If you look about you with a critical eye and mind, you are sure to find equally inept illustrations.

Conclusion

A helpful check upon the appropriateness and suitability of a caption is to examine the content on the basis of (1) the thought, and (2) the phraseology. The thought should challenge the pupil to study the picture and should be limited to the actual ideas to be obtained from a study of the picture. The phraseology should be simple, direct, free of verbiage and high sounding terms, and based on the child's experience. The stating of a satisfactory caption may not come with the first attempt, not even the second. After some practice, the main theme of a picture will be readily recognized and the caption will provide challenging class discussions.

ANNUAL MEETING OF THE NATIONAL COUNCIL FOR THE SOCIAL STUDIES

The Twenty-fourth annual meeting of the National Council for the Social Studies will be held at the Hotel Statler in Cleveland, Ohio, November 23-25, 1944. An extensive and comprehensive program has been prepared. Following the reception at 4:00 P.M. on Thursday, November 23, there will be a showing of some of the newer materials and devices in the field of audio-visual aids. The evening session will be devoted to the topic of "Moral and Psychological Basis of a Lasting Peace." The general session on November 24, will consider "Problems of Economic Welfare in the Post War World."

The program on Saturday will be devoted especially to the presentation and discussion of a special publication, "which will chart the entire field of social education in the postwar world."

On Friday, November 24, there will be a joint session of the National Council for the Social Studies and the National Council of Geography Teachers. The program is being formulated. The chairman and co-chairman are Dr. J. R. Whitaker and Dr. Guy-Harold Smith. Among the speakers will be Dr. H. O. Lathrop, who will speak on "The Place of Geography in the Social Studies," and George J. Miller, "Educational Services of Geography in the Emerging World Community." More complete details of the program will appear next month. Other topics of special interest to geography teachers are:

A Canadian Estimate of United States Understanding of Canada
A Latin-American Estimate of United States Understanding of Latin-America
American Understanding of the Far East
The Soviet Union and Russian-American Relations
Economic Welfare in the Post-War World
Intercultural Relations
Selecting and Organizing State and Local Materials
Balance between Local Community and Study of Wider Areas (Middle Grades)

For further information address Merrill F. Hartshorn, National Council for the Social Studies, 1201 Sixteenth Street, N.W., Washington, D.C.

Hotel reservations should be made well in advance by writing directly to the Hotel Statler.

INTEREST-STIMULATING DEVICE

Learning the Map Thru Postmarks

In communities where children often have the opportunity to travel they cannot help but develop an interest in the map of the United States. The following activity creates much interest and teaches facts in a novel way which can not possibly spoil any of the study in later grades.

As a result of the influx of Christmas cards and letters from touring members of the group, the children of my third grade developed a keen interest in postmarks. They were constantly being brought into the room, some pasted on cards according to states, and in other forms, until finally we struck upon the idea of making a map and placing the postmark in the locality in which it belonged. We borrowed a large 50″ × 30″ map of the United States from the fifth grade and traced it on wrapping paper. The children wrote in the name of each state as well as the Great Lakes, the Atlantic and Pacific oceans, etc. After this was completed we had a very presentable map to hang on the bulletin board. As the postmarks appeared now, the children who brought them in were allowed to look up the location of the city in the atlas and paste the postmark on the corresponding place on the map. It wasn't long before we had at least one city represented in each state and all of the large cities and capitals.

To make the map more interesting, each child was allowed to put his name in every state in which he had visited. Thru this device we had an opening to learn something about almost every state from the children's own observations.

As the cities began to be familiar to the group we put a red circle around each postmark that represented a capital city.

Out of this have come many individual investigations on the part of some enterprising members of the group who are particularly interested in the study. Two boys wrote a series of questions concerning facts that we had discussed while making the map. This was a very interesting piece of work and copies were made for each member of the class.

From this simple activity the children have easily and enthusiastically learned the names of the states, which direction indicates East, West, North, and South on a map, which states are located in these sections, and the various markings which indicate the capitals and the relative population of cities.

Margaret H. Simpson

Flossmoor, Illinois

EDITORIAL NOTES AND NEWS

Facts about the weather secured last winter indicate that regular winter schedules can be flown across the North Atlantic both eastbound and westbound. Previously many were of the opinion that the North Atlantic should be used only for eastbound flights, the return being made by way of Africa and South America. Data secured for the Air Transport Command includes information on how to thoroly winterize planes and how to use or avoid winds. Westerly winds of more than fifty miles an hour are not uncommon. Regular flying time between New York and England is cut about ten hours by the new route as contrasted with the southern route.

According to the Brazilian government's Trade Bureau, the output of the Santa Catarina coal fields has been doubled, with prospects for further increase. Part of this coal will be sent by ship to Rio and then by rail to the great Brazilian steel plant at Volta Redondo. This plant is located near Rio in the Paraíba Valley. The iron ore is to come by rail from the great high grade iron ore reserves in Minas Gerais, located chiefly in the area drained by the Rio Doce. The largest center is near Itabira. Part of the money to finance this plant came from a loan granted by the Export-Import Bank of the United States.

One of our most serious shortages is that of high-quality timbers. There are about a half billion acres of commercial forest land in the United States. One fourth of this land is in federal or state forests. Nearly a third is owned by farmers and the remainder is owned by lumbering and other industries. Nearly seventeen billion cubic feet was cut or destroyed in 1943. The saw-timber drain was almost twice the annual growth.

The National Geographic Society, Washington, D.C., announces that the first issue of the 1944-45 Geographic School Bulletins will be available in October. This weekly illustrated periodical features up-to-date material on places, peoples, commodities, and scientific developments of current interest. Each of the thirty bulletins contains five brief articles and seven illustrations, some of which are maps. The Bulletin's nominal cost merely represents the mailing costs. Since government restrictions on paper limit the subscription list, the Society urges subscribers wishing this rich news-background service to place their orders at an early date.

A series of pamphlets on ten of the American republics, prepared by the Office of Inter-American Affairs, is available at nominal charge from the Superintendent of Documents, Government Printing Office, Washington, D.C.

The following are a few of the natural advantages afforded by the site of Canada's largest rubber factory which began processing synthetic rubber last January at Sarnia, Ontario. Its annual capacity is 38,000 tons. The lowlands along the St. Clair River afforded adequate space for the buildings, transportation lines, and the housing units. Salt mines nearby provide the brine which is brought in by tank trucks. No cooling towers are necessary as the temperature of the St. Clair River water varies from about 34°F. in winter to 70° in summer. About 45 billion imperial gallons of water are needed a year according to estimates now available. The gas, petroleum, coal, and benzol are readily available from nearby plants or are efficiently transported over the cheap trans-

portation routes available. The most outstanding single piece of equipment is the butylene concentration tower, 165 feet high and 12½ feet in diameter. This tower weighing 150 tons was built near Montreal and transported by a special train with a special crew, operating at a speed not exceeding 15 miles an hour. It took two weeks to plan the loading of the tower on the three special flat cars but it required only 15 minutes to actually do the job.

The last issue of the *Geographic Quarterly* issued by the Department of Geography of the Austin Peay State College, Clarksville, Tennessee, is devoted to the conservation of natural resources.

According to the United States Department of Agriculture, only slightly more than 40 per cent of America's farm homes are electrified. A big expansion in postwar rural electrification is anticipated. There are 800 Rural Electrification Administration cooperatives already in existence in the United States.

The Commission on Palestine Surveys is planning a vast reclamation project for Palestine, the basic outline of which has been formulated by Dr. Loudermilk of the U. S. Soil Conservation Service. The plans call for the diversion of Jordon River water on to several hundred thousand acres of land. Such a diversion of water would result in a serious lowering of the level of the Dead Sea into which the Jordon River empties. To prevent this, the plans provide for an inlet of Mediterranean Sea water which in its drop of about 1300 feet to the Dead Sea level would be used for electric power development. Further exploitation of Dead Sea water would be promoted to yield products including potash, bromine, and magnesium. The entire project should provide a living for more than a hundred thousand families. The Commission hopes that this project will serve as an example for further projects in nearby Near East countries, especially in Iraq.

The Geography-Science Institute of the Rhode Island College of Education held its spring meeting in conjunction with the East Greenwich schools. The promoters of the Institute, Professors Jensen and Read, believe in taking science to the people themselves thru lectures and exhibits and urge field work for schools and recommend that the services of the school children be used in fact-finding surveys of the community's resources and developments. A large attendance at the lectures and exhibits of the Institute was reported.

GEOGRAPHICAL PUBLICATIONS

Stephen Winsor Reed. **The Making of Modern New Guinea,** xix and 326 pages including appendix, bibliography and index. Memoirs, Vol. XVIII, American Philosophical Society, Philadelphia, 1943, $4.00.

The geographer will find interesting and profitable reading in Dr. Reed's carefully written study. The book is based upon the results of a field investigation made under the auspices of the Department of Sociology at Yale University, and presents a comparative study of government economic and social development in northeastern (Mandated) New Guinea under German and Australian control. It provides a picture of the complex social structures and their adaptation to modern civilization.

After the preface and a short introduction commenting upon The World Crisis and the Kanaka Revolution the book is divided into seven chapters: (1) The Land and the People, subdivided into two sections (a) The Physiography of the Mandated Territory and (b) The Aboriginal Cultures, a Survey; (2) The Development of European Control; (3) The Beginnings of Permanent Contact; 1872-1884; (4) Native Administration, German: 1884-1914; (5) Native Administration Australian: 1914-1940, subdivided into (a) The Military Administration, and (b) The Civil Administration; (6) Economic Prospects of the Mandate; and (7) Modern New Guinea, the Genesis of a New Society. The book closes with the appendices which are devoted to (a) The Language Adjustment: Melanesian Pidgin, (b) Port Breton, a Tragic Chapter in Tropical Colonization, and (c) Population Figures: 1921-1938, and a final section devoted to bibliography and index.

Chapter one is of more than passing interest to students of tropical human geography, as the author describes settlement types, food, housing etc., in some detail. Moreover, if the reader cares to pursue the subject further, ample opportunity is given thru the one-hundred and forty-five footnotes which provides documentary support for statements made. In this chapter as well as thruout the whole study, many relationships between native activity and the physical environment may be noted.

A short summary after each of several chapters adds value to the book; and the final paragraph summarizes a major theme stressed by the author: "Much of the old culture is rapidly disappearing . . . but intelligent control of the acculturation process in this country has made the transition from the old to the new immeasureably less violent than in many another region of the world. The New Guinea native has profited from it in a variety of ways—in a greater sense of security, in better health, in a steadier diet. Whether or not he is a happier individual than his father or grandfather we cannot know."

Earl B. Shaw

State Teachers College
Worcester, Mass.

Leonard O. Packard, Bruce Overton and Ben D. Wood. **Our Air-age World.** 838 pp., maps, photographs, append., index., Macmillan Company, 1944. $2.80.

This is an exceedingly interesting book; it is also a timely one, and timeliness may be criticism as well as praise in a textbook that must wait a few months before attaining its effective use during these rapidly changing days.

The book is divided into eight parts: "Part One. Global Geography," "Part Eight. The World Tomorrow," and in between six parts which deal one by one with the six continents. The treatment of the various topics is fresh and invigorating but in the main brief. In Part One, "A Unit of the World," there is an excellent summary of lands

and races which in an expanded treatment would be a good contribution to post-war geography. Parts Two to Seven inclusive expound the economic geography of the six continents and here the text is fairly stable since the pre-war economies were based to a large degree on environmental conditions, and it is expectable that these same economies will continue in the post-war world, except in those few areas where the balance between population and the economy is maladjusted.

Certain sub-topics, which may affect the life of the book, such as "Food is Ammunition," "France—Germany's Traditional Enemy," "The Union of Soviet Socialist Republic—A Nation with Much to Avenge," "North Africa—A Springboard for the Allies," and many others reflect the feelings of a nation at war and have no forward outlook. The authors have to some extent challenged criticism of their viewpoint by inserting in the Foreword that "it is for active participation in this new world that the youth of the country must be prepared. Our citizens of tomorrow must understand as fully as possible the forces now striving in the world,—the one to enslave mankind, the other to make it free." Suggestions for a post-war curriculum in geography are various but in general it is agreed that since the world has become considerably smaller in terms of time, an understanding of all peoples and a neighborliness are essential for a settled world. Many teachers of geography have contended and still do that this work is largely and essentially the province of their work in the schools. Only by a mutual friendliness and sympathy can there be any hope for a stabilized world. However, for a people at war with social impulses in abeyance, this book should find an interested audience even outside the doors of the schoolroom; and to these the book is highly recommended today (with a reservation about tomorrow).

The volume is well illustrated, with many pictures of real interest and value, a plentitude of maps and charts which illuminate the text, and easily read graphs and diagrams.

ROBERT M. BROWN

Providence, R.I.

George T. Renner and Associates. **Global Geography.** 728 pp.; maps, illus., bibliog., study questions, index. Thomas Y. Crowell Co., New York. 1944.

The review sections of learned periodicals, the summer issue of the *Yale Review*, for example, show that books originating in the international turmoil nearly monopolize the non-fiction field. *Global Geography* is of this origin. "We are a nation of geographical illiterates," it is said (not, to be sure, for the first time); inability to think geographically "exists even among many of our leaders." A global war, so runs the prefacing statement, has awakened in Americans the consciousness of "the need for some understanding of the nature of geography." New situations require new devices or, failing this, reconversion of obsolescent machinery; for authors, this calls forth inventiveness, and a willingness to eliminate, to substitute, and to refashion. The geographers writing here "have broken with tradition as regards both content and presentation," but in the opening chapters not so sharply as this promise suggests.

Part I, "Resource Patterns and World Affairs," delineates large-scale arrangements of land masses and oceans, atmosphere and climate, earth relations, soils, vegetation, and minerals, with an opening chapter on "This Geographical World," and a concluding one on "The Component Pattern of the Environment." The several authors have been generally successful in omission of details which would have obscured the world-wide picture.

Part II, "Geonomic Problems," introduces features new to works of this sort. The adjective, intended to suggest "world-economic," should appear in hyphenated form, if only to avoid confusion with "geonomics" (geography-economics) which was a favorite term of the late Professor Whitbeck. Here are interesting, broadly conceived

treatments of "Man, Nature, and the Ecological Balance," "Technology and Geographic Change," and others on conservation, raw materials vital in war and peace, and industrial districts.

Part III, "Geo-Cultural Problems," treating of race, population distribution, urban centers, and current events, maintains the pace and scale set by the preceding sections.

Part IV, "Geopolitical Problems," will perhaps prove to be the most exciting to the majority of readers. "Geographic Factors in Diplomacy," "Geography and War Strategy," and "Resources and World Peace," are chapter titles suggesting the content and spirit of this section. Separate chapters present the political geography of Russia, Southeastern Europe, and Britain; the historical approach stressed in them indicates some disagreement with the editor's statement elsewhere that "it is becoming increasingly apparent that such issues [of power geography] in the world today are not being decided by the merit of historical arguments over past events."

The observation that "geographers have done little more than write for other geographers" is debatable; in any event the profession will be receptive of this courageous attempt to reach a large and appreciative audience. Altho existent classroom needs have not been a controlling guide in the content and arrangement of *Global Geography,* perhaps there is a laudable, tho unstated, motive of giving new directions to geographical courses of study—each of the thirty-five chapters is supplemented with sample questions and topics for further inquiry and discussion. There are also critical bibliographies and two indexes—by topic and by name. From the standpoints of both the general reader and college student, the book seems well balanced and its literary style, despite the multiplicity of contributors, of whom there are thirty, maintains surprising uniformity.

But do not expect the impossible. No global geography, especially one originating in a period of war, could view this world with Olympian detachment. It is no discredit to the editor, authors, and publishers to suggest as a by-line to *Global Geography,* "by American authors for American readers."

Ralph H. Brown

University of Minnesota

Griffith Taylor. **Australia.** 455 pages, illustrations, index. E. P. Dutton and Company, New York. 1943.

This book is the revised second edition of *Australia—A Study of Warm Environments and Their Effect on British Settlement.* The deletion of the subtitle and the rearrangement of a two-page map are the only changes. The shortened title it doubtless an improvement. Altho the variety of facts and ideas presented in the three parts of the text deal exhaustively with Australia, the effects of warm environments on British settlement does not constitute the major theme.

It is rather difficult to reconcile the organization of the extensive and varied material of this book, which "is an attempt to produce a text for use in high schools and universities along modern lines," with the general pattern of geography as presented in the secondary schools and colleges of the United States. The introduction makes effective use of a traverse across southern Australia. For this purpose the only photographs in the entire book are used. The rest of the illustrations (142 in all) are diagrams, charts, and sketch maps. The material that follows in Part I is historical and physical. Natural regions are described in Part II, and cultural conditions are presented in Part III. Beyond a doubt this is the most complete and authoritative text on Australia, yet it does not possess the teachable geographic qualities sought in the schools of this country.

In the Preface the author apologizes for a "rather personal approach," apparent thruout the text, which he explains by the fact that he was for twenty years the sole

professional geographer in the Commonwealth and thus has been in a favorable position to see geography develop in a pioneer continent. One wonders if Professor Taylor is referring to the actual development of the science or to his observations of the development of a pioneer continent, his interpretations of which constitute this book.

John H. Garland

University of Illinois

Henry M. Leppard and L. Philip Denoyer. **Map Projection Studies.** No. P208. 20 pp. Illustrated. Denoyer-Geppert Co., Chicago 40, Ill. 1943. 60 cents.

Each page depicts one or more map projections. Those developed by graphic methods based on a geometrical diagram, with a light or eye at a given point within or outside the globe being projected, are so indicated. Attention is directed to the distortion in area or shape resulting when the whole earth or a part of it is drawn upon a given projection as a base. Land areas mapped on each projection are colored red, making it easy to compare shapes and areas with those mapped on a globe of the same scale. The cartographer's name appears alongside the projection he developed, and the year when his projection became available. Brief explanatory notes accompany each projection and indicate whether it is best adapted as a base for a map of the whole earth or for a particular part of it. If a given map on one of these projections has some special merit for a given use it is so indicated.

Donald Pierson. **Negroes in Brazil.** 392 pp. Illustrated. The University of Chicago Press, Chicago, Ill. 1942. $4.50.

The author's conclusions are based on the two years of field studies carried on in Brazil, especially in Bahia, for the Social Science Research Committee of the University of Chicago. His findings reveal that the Brazilian Negroes, originally slaves imported from Africa, and their descendants, are gradually disappearing due to biological absorption by the Portuguese who expanded from Europe into Brazil. Their social and economic advancement is not hampered by race prejudice, even tho class distinctions admittedly exist. Frequent comparisons are made with the results of racial contacts in the United States and other parts of the world.

Hugh Knowlton. **Air Transportation in the United States, Its Growth as a Business.** 72 pp. Illustrated. The University of Chicago Press, Chicago, Ill. 1941. $1.25.

The change from a government enterprise of transporting mail to one of private business carrying both mail and passengers and the various federal acts to regulate it are briefly reviewed in the introduction. This is followed by an overview of the competition the commercial air lines had to meet in a country already served by a vast rail and highway network. Since speed is the major contribution to transportation made by air lines, the author next reviews the technical developments making this speed possible, along with safety and dependability. He then analyzes the growth of the business of aviation and some of its probable future trends. Military demands have retarded the rate of growth of civil air transportation. However, civil aviation will profit by the great technical advances made by military aviation and by the public's increased awareness and appreciation of the civil air lines.

Irving Fisher. **Likaglobe, a map foldable into a near-globe.** Likaglobe, 405 Temple Street, New Haven 11, Conn. 1943. Forms 1 and 2, each 10 cents; Forms 3 and 4, each $1.00.

This icosahedral projection for a world map was developed by Professor Fisher of Yale University, in order to provide a flat map of the world that makes world relationships easy to visualize. It can be easily and quickly folded into a shape resembling a sphere. The geometrical figure on which the projection is based is that polyhedron called the regular icosahedron, the twenty faces of which are equal equilateral triangles. The twenty triangular parts into which the world is divided are each mapped on the gnomonic projection. These triangles when laid out flat necessitate a number of interruptions. The map in forms 1 and 2 shows them arranged with the equator continuous and each pole interrupted in five segments. When folded this makes a near-globe. Form 3 is the same only larger and comes already cut half thru for easier folding. Form 4 consists of a set of twenty separate cardboard triangles which can be reassembled in a great many ways in order to bring out a variety of world relationships, or it can be used as a map puzzle.

Floy Hurlbut. **The Fukienese.** 143 pp. Illustrated. Ball State Teachers College Book Store, Muncie, Ind. 1939. $2.00.

The introduction gives an overall view of the topography, drainage, and climate of Fukien. The population, crowded into the many valleys of this rugged area, exhibits much diversity in origin, customs, and outlook on life. The economic life of the people is definitely related to the environment; but it, together with the family life and social customs, reflect but slight contacts with western peoples.

Samuel Eliot Morison. **Portuguese Voyages to America in the Fifteenth Century.** Harvard Historical Monographs, XIV. Illustrated. Harvard University Press, Cambridge, Mass. 1940. $2.00.

This volume summarizes the author's investigations of the claims that Portuguese discoveries of the Americas antedate those of Columbus. He has examined and weighed all extant evidence and used his nautical experience as a check on the reliability of certain reports and charts, especially as to the accuracy of their references to currents and seasonal winds. Among the many accounts of Portuguese expeditions to discover islands and mainlands beyond the Azores are the Barcelos-Fernandes voyages that resulted in the naming of Labrador. The author also examines the instructions that DaGama prepared for Cabral's use in going to India in 1500. After comparing them with sailing instructions by Maury, the United States Hydrographic Office, and the British Admiralty, he concludes that Cabral should be credited with sighting Brazil. The author believes further evidence will be uncovered; but, in the meantime, he concludes that Portugal's greatest achievements center in the explorations around Africa to India, not in the Atlantic beyond the Azores.

Raye R. Platt, John K. Wright, John C. Weaver, and Johnson E. Fairchild. **The European Possessions in the Caribbean Area.** Map of Hispanic America Publication No. 4. American Geographical Society, New York. 1941.

This publication is a very timely one in view of the strategic location of these possessions in relation to the Panama Canal, their value as actual or potential air or sea bases, and their importance as sources of war materials—particularly oil and bauxite. Factual information is provided for each of the possessions relative to area and land forms, climate and native vegetation, the types of people and their social and economic status, production and trade, and the transportation pattern. A list of references is included, also a map of the Caribbean area.

Pedro J. Lemos. **Guatemala Art Crafts.** 40 pp. Illustrated. The Davis Press, Inc., Worcester, Mass. 1941. $3.75.

A pictorial story of Mayan art crafts. Especially noteworthy are the designs of cotton and woolen textiles, and the way they are fashioned into clothing, belts, bags, blankets, and head coverings. A given design may have been handed down from generation to generation until it becomes definitely associated with the Indians of a particular locality. Bird, tree, human, and animal motifs are used, in gay colors obtained from vegetable dyes. Included also are designs used in pottery, basketry, necklaces, face masks, wood, metal, and stonework. The book is not merely of interest to art students but it is a helpful service to those visiting Guatemala. Four pictorial maps indicate places and things to be seen. Some of the illustrations are in authentic colors.

NEW PUBLICATIONS

Ruth Benedict and Gene Weltfish. **The Races of Mankind.** 32 pp. Illustrated. Public Affairs Committee, Inc., 30 Rockefeller Plaza, New York 20, N.Y. 1943. 10 cents.

A summary of what is being done in this country to eliminate race prejudice and encourage interracial cooperation.

Captain E. Dwight Salmon and Evalyn Bayle. **Americans Together.** 214 pp. Illustrated. Webster Publishing Co., St. Louis. 1943. $1.00.

A fusion of the social studies dealing with Latin America for junior high school and upper elementary levels.

Arctic Manual. **Technical Manual No. 1-240.** War Department. 74 pp. Superintendent of Documents, Washington, D.C. 1942.

Descriptions of topography, climate, polar light, plant and animal life; and suggestions for types of shelter, clothing, food and other equipment adapted to the Arctic.

Derk Bodde. **China's Gift to the West. Asiatic Studies in American Education, No. 1.** 41 pp. Illustrated. American Council on Education, Washington, D.C. 1942.

Prepared for the Committee on Asiatic Studies in American Education.

Maxwell S. Stewart. **War-Time China.** 63 pp. Illustrated. American Council, Institute of Pacific Relations, Inc., 1 East 54th St., New York 22, N.Y. 1944. 25 cents.

The situations in China today regarding political factions and the struggle for democracy; problems in transportation, inflation, and in producing food and other basic needs; and the difficulties of satisfying the diverse interests among the various economic, professional, and industrial groups of people.

H. T. U. Smith. **Aerial Photographs and Their Applications.** The Century Earth Science Series. 372 pp. Illustrated. D. Appleton-Century Co., New York. 1943.

Practical suggestions for the interpretation of aerial photographs and the use thereof in surveys and map-making procedures.